

Project Agreement
for the
Acquisition of the
NOAA Operational Central Computer System

September 2004

I. Background and Purpose

NOAA has established a new consolidated, NOAA-wide high performance computing (HPC) acquisition strategy to better serve NOAA's HPC operational and research and development (R&D) requirements. This new acquisition strategy will position NOAA to take advantage of changes in the HPC marketplace and improve NOAA's return on investment for its operational computing.

Through this acquisition, NOAA seeks to acquire an HPC system to meet its operational computing requirements. The new system will replace the current operational computer system at the National Centers for Environmental Prediction (NCEP) starting in October 2006. The desired new system, called the Operational Central Computer System (OCCS) and Backup OCCS, will replace the current NCEP primary high performance computer and its backup and will function as the computer system used for operational environmental prediction within NOAA. The current NCEP development system will be replaced as part of the separate NOAA-wide R&D HPC acquisition. The major operational functions of the OCCS will be to assimilate environmental data and to execute the numerical models that form the basis for all routine weather and climate forecasts, public and private, produced in the United States.

NOAA's need to acquire a new HPC is identified in the current NOAA Strategic Information Technology Plan and is essential to achieve NOAA's strategic goals to "Serve Society's Needs for Weather and Water Information" and to "Support the Nation's Commerce with Information for Safe, Efficient, and Environmentally Sound Transportation." Key NOAA NWS environmental modeling and forecast accuracy goals are also dependent upon the timely acquisition of the OCCS.

In order to fulfill the objective of awarding a contract for a OCCS in August 2005, NOAA will utilize the Department of Commerce's re-engineered acquisition process termed CONOPS. That process is described in a document entitled *Department of Commerce Acquisition Process Case for Change*. The CONOPS process was successfully used for the NCEP Class VIII HPC system acquisition and for the current Central Computer System (CCS) acquisition. The intent of the CONOPS process is to create an acquisition environment that will benefit both the vendor community and the Government. The Government seeks the cooperation of the vendor community in order to conduct business in an atmosphere of integrity, openness, and fairness.

This Project Agreement establishes an agreement between the OCCS Acquisition Team (the Project Team), the NOAA CIO, and the Assistant Administrator for Weather Services. The agreement empowers the project team to acquire, deploy, and monitor the systems and services that comprise the OCCS. The Project Agreement outlines the objectives of the project, Project Team duties, budget availability, and the high-level milestones for the accomplishment of these project objectives.

II. Authority

This project is hereby authorized by the NOAA CIO and the Assistant Administrator for Weather Services. It is identified as a requirement of NCEP, the organization tasked with operating state-of-the-art computer systems, which execute operational environmental models to satisfy the Nation's requirements for weather and climate forecast information. The OCCS acquisition undertaken by this project requires a Delegation of Procurement Authority (DPA) from the Department of Commerce.

III. Project Objectives

Strive for the best return on investment when acquiring HPC resources

The Project Team recognizes there are finite resources available to support NOAA HPC requirements, and these must be maximized in order to provide the highest benefit to NOAA's mission. Striving for the best return on investment supports the Government getting the best value and cost-effectively achieving NOAA's mission. Some of the implications of this objective are as follows: (1) NOAA examines a wide range of acquisition strategies to determine the most cost-effective vehicle to acquire HPC resources. This includes considering the implications of selecting such options as: leasing vs. buying, Government vs. contractor facilities, and single vs. multiple NOAA contracts for HPC resources. (2) Appropriate market research is conducted to determine the most cost-effective acquisition strategy. (3) While assessing options, a cost-benefit analysis is completed for each alternative. This analysis considers all costs associated with meeting the requirement, including telecommunications.

Establish a long-term HPC contract to meet NOAA's operational computing needs

In preparation to acquire a OCCS for NOAA, the Project Team will characterize the NOAA operational workload, in consultation with other NOAA organizations with HPC systems, and seek concurrence from the NOAA HPC Board. This system must be operational prior to October 2006 when the contract for the current CCS ends. A base performance period of 51 months, a 48-month option period, an additional 12-month option to mitigate potential difficulties in the transition to the next system is proposed (July 1, 2006 - September 30, 2015). In order for the new system to be fully operational in September 2006, a contract should be awarded in August 2005.

Sustain NOAA's high level of non-time@ delivery service

The NOAA OCCS is more than simply a high-speed computer. It includes additional hardware (storage devices, communications interfaces, and other peripherals), software (primarily, but not limited to, the operating system, file system and compilers), full system maintenance, and support services. This total system comprises the core computational resource for the operational numerical weather and climate prediction efforts of the National Weather Service. The operational system provides time-critical, essential governmental services. Therefore, a key objective of the Project Team is to obtain an operational system with a very high level of reliability. The Project Team will use past performance and the use of Commercial Off The Shelf components as key indicators of reliability. System attributes associated with reliability will be scrutinized. Minimum levels of performance, specifically tied to NOAA's projected production schedule and NWS production requirements, will be detailed in the contract.

Phase-in new technology to maximize price/performance and minimize risk

One of the objectives of this project is to maintain currency with the rapidly evolving technology of such systems in a cost-effective manner. At the same time, NOAA seeks to minimize increased risk associated with frequent technology upgrades and the disruption to operations. As demonstrated in the cost/benefit analysis for the previous NCEP CCS HPC acquisition, it is possible to increase the overall computing capacity of NOAA HPC systems with improved return on investment by adjusting the replacement cycle to match commercial high performance computing technology advances. Based upon past experience, NOAA anticipates a significant technology refresh cycle of 24 to 30 months. Technologies that allow non-disruptive incremental performance upgrades, between refresh cycles, are also desirable.

Employ industry standards to measure computing efficiency

The Project Team will ensure the OCCS delivers cost-effective computational capability by regularly evaluating its performance with respect to other high performance computers. An annual review process, conducted by a subset of the Project Team, will include an industry survey, consideration of how to best achieve required performance goals via system replacement, enhancement and/or augmentation and a comparison with industry standard measures such as Moore's Law.

Provide contracting flexibility to meet customer requirements

Advanced data assimilation systems, higher resolution models, improved physics and ensemble forecasting techniques will enable the NWS to produce forecasts with better accuracy and longer time scales than ever before. These expanded models and data assimilation systems are computationally demanding and require very robust capabilities in order to execute within a fixed time window of short duration. In addition to these computational requirements, NOAA requires a high performance storage/retrieval system, support services and contract flexibility to

accommodate diverse needs, such as facility leasing/upgrades, application programming support, OCCS augmentations and/or upgrades, visualization support and user workstations/servers associated with the OCCS. Integrators are encouraged to compete as the prime contractor for this requirement.

IV. Approach

This project will follow the general approach and guidelines established during the CONOPS acquisition of NCEP's Class VIII HPC system, the current NCEP CCS HPC system, NOAA's Forecast Systems Laboratory HPC system, and NOAA's Geophysical Fluid Dynamics Laboratory HPC system. Based on these experiences, the Project Team will endeavor to provide offerors with sufficient time to work with NOAA's operational benchmark codes and prepare proposals. A contract option period will be structured to assist offerors in distributing risk. In return, NOAA requires very high standards for reliability and world-class computational and storage sub-system performance.

The CONOPS process will speed the exchange of information, help assure equal opportunity for all respondents and encourage openness by making as much information as possible available simultaneously to all parties. It is intended to meet the Government's need for computing capabilities by contracting with the private sector. This process makes use of market research to help determine an acquisition strategy and to refine the Government's requirements in relation to the capabilities and approaches of the private sector.

To promote an equitable and active dialog with all members of private industry who may be interested in responding to the stated needs of the Government, electronic communications will be used extensively throughout this solicitation process. This Project Agreement and the solicitation documents that result from the work of the Project Team will be posted publicly on the Internet, accessible through NCEP's home page, <http://www.ncep.noaa.gov>.

V. Project Team Membership

The OCCS Project Team consists of a core group that provides the steering and decision-making authority for the project. This group is augmented by several advisors, primarily from NOAA, and a small administrative staff. The team is headed by a Project Team Leader who has overall authority and responsibility for the successful accomplishment of the project objective and fulfillment of the terms of this Project Agreement. The selection and assignment of the other team members has been made on the basis of cross-functional needs and includes a warranted contracting officer. Additionally, the advisors include an information technology analyst, a budget analyst, a representative from the Office of the General Counsel, representatives from the NOAA High Performance Computing and Communications (HPCC) Office, and a DoC risk management specialist.

VI. Empowerment and Management Review

Subject to approval by the Source Selection Official, the Project Team is hereby authorized to take all steps necessary for the acquisition of the NOAA OCCS, including related hardware, software, and support services. The Project Team will make technical and business recommendations to the Source Selection Official prior to the key scheduled milestones noted below. No authorizations other than those already obtained or described in this agreement will be required.

The Project Team is empowered to conduct any acquisitions necessary to support the OCCS procurement. This includes complete authority to conduct micro purchases, purchase card acquisitions, and contracting by other methods, within the budgetary limits and within the project scope described in the Project Agreement. All contracts will be executed by a warranted Contracting Officer who is a member of the Project Team.

The Project Team will fulfill its responsibilities with respect to management oversight by conducting briefings immediately prior to the following key actions:

<u>Actions</u>	<u>Schedule Completion</u>
1. Release Project Agreement	September 2004
2. Release RFP	December 2004
3. Competitive range determination/down-select	March 2005
4. Award decision	August 2005
5. System acceptance	July 1, 2006
6. System fully operational	August 2006

The briefings will include a review of project milestones and an update of the state of the budget supporting the OCCS. The briefings will also provide a forum to address other issues of interest to senior management.

It is the intent of the parties to this Project Agreement that except under unusual circumstances no additional reviews or documentation will be required. The Project Team includes DoC, NOAA, and NWS advisors who will participate throughout the acquisition process and that on-

going interaction will serve in lieu of reviews and clearances by the DoC, NOAA, and the NWS.

The following planning documents form the basis for the activities of this project and they will be provided publicly:

NOAA Strategic Plan
NOAA Strategic IT Plan

The following documents will also be provided publicly by the Project Team during the course of this acquisition:

Project Agreement
Solicitation, including Statement of Need, all Amendments

While protecting vendor confidentiality, management will have complete access to the Internet facilities maintained by the Project Team. In addition, management will be granted access upon request to procurement sensitive documents maintained on a secure intranet. The Internet and intranet facilities together will contain the most recent drafts of all pertinent documents. The Project Team will inform management of significant deviations from the acquisition milestones that may affect the planned award in August 2005 or the month in which the system is expected to become fully operational (August 2006).

VII. Estimated Value

The total planned value of the OCCS Acquisition Project for the 51-month base period (July 1, 2006 - September 30, 2010) is estimated to be \$96,300,000. Of this amount, \$21,000,000 will be included in a contract option to cover the estimated cost of supporting an Air Quality Forecast System (AQFS). Funds may or may not be available for this contract in FY 2006. The four-year option period (FY11 - FY14) is estimated to cost \$96,000,000. Of this amount, \$24,000,000 will be included in a separate contract option for the AQFS. The final 12-month option during FY 2015 is estimated to cost \$24,000,000, of which \$6,000,000 will be in a separate contract option to support the AQFS. The entire acquisition has an estimated total value of \$218,300,000. This budget profile is consistent with the out-year funding levels included in the President's FY 2005 NWS Weather and Climate Supercomputer Budget and the NWS Weather and Climate Supercomputer Backup Budget. A portion of the NWS Weather and Climate Supercomputer Budget supporting research and development will be included in the separate NOAA-wide R&D HPC acquisition. Funding is planned for the 111-month period (July 1, 2006 - September 30, 2015) and will be subject to the availability of funds, provided through the annual appropriation process. This level of funding is required to

acquire appropriate computer system resources, including all system maintenance, support, and system enhancements. The following is the annual breakdown of the funding planned (but not guaranteed) for this acquisition.

		Fiscal Years									
		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Equipment Acquisition, Maintenance, & Support (Weather & Climate)		5.3	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Equipment Acquisition, Maintenance, & Support (Air Quality)		1.5	3.0	4.5	6.0	6.0	6.0	6.0	6.0	6.0	6.0

(Dollars in millions)

VIII. Milestones

The overarching goal of this project is to take all steps necessary to provide for the timely acquisition and continued availability of computational resources for NOAA’s operational mission, including related hardware, software, and support services. To ensure that the capabilities of this system will be available when needed, the Project Team plans to award the OCCS contract in August 2005. This contract will call for the subsequent delivery and installation of a system in October 2005. Acceptance of the system running the full NOAA operational production suite will be required by July 1, 2006, with operational use beginning in August 2006.

The following milestones present an overview of the project schedule.

Issue preliminary FedBizOpps announcement	July 2004
Publish Project Agreement	September 2004
Release preliminary benchmark codes	September 2004
Issue draft RFP	October 2004
Issue pre-solic. FedBizOpps announcement	November 2004
Release RFP/final benchmark codes	December 2004
Receive initial vendor proposals	February 2005
Complete competitive range determination	March 2005

Vendor down-select	March 2005
Conduct LTDs	April 2005
Receive revised proposals	May 2005
Receive final proposal revisions	June 2005
Award contract	August 2005
Delivery of services/installation	October 2005
Accept system running full production suite	July 1, 2006
Parallel operations	August 2006
System fully operational	August 2006
CCS powered down	October 1, 2006
Annual system performance review	October 2007

IX. Term

The project begins at the date of the approval of this document and concludes when the OCCS is removed from operations. The contract base period of performance is projected to be 51 months, with a 48-month option period, followed by a final 12-month option for a total of 111 months. The final year of operation for this system will overlap with the first year of operation for a successor contract.

X. Performance Goals and Measures

This project activity has clearly defined performance requirements as well as fiscal and temporal constraints. Maintaining the acquisition schedule described herein is the highest priority for the Project Team.

In order to meet NOAA's performance requirements, the computational capability of the proposed OCCS will be measured by carefully reviewing demonstrated performance on a suite of NOAA operational benchmark programs and evaluating the system's ability to meet NOAA's daily operational workload. The benchmarks will measure data storage and retrieval functions as well as raw computational performance. Once the OCCS is installed and operational, the Project Team will ensure the continuing acceptability of the OCCS and verify its utilization supports all pertinent operational schedules and appropriate scientific goals.

Performance monitoring during the life of the system will be continuous. Sufficient system resources to achieve NOAA's operational goals are required not less than 99 per cent of the time.

During the life of the OCCS, the Project Team will conduct annual reviews of the system in order to consider its performance and to evaluate opportunities for extending its capabilities.

System upgrades must be available within the initial budget constraints of this acquisition. The review process, which will result in decisions on how best to enhance overall performance, will begin within one year of system acceptance.

